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09/960,532	09/21/2001	Yoram Ofek	SYN 1778	6735

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EXAMINER	
ROBERTS, BRIAN S	
ART UNIT	PAPER NUMBER
2662	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/960,532	OFEK ET AL.	
	Examiner	Art Unit	
	Brian Roberts	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/21/2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claims 1-45 have been examined

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-45 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

- In reference to claims 1, 24, and 37

The specification does not adequately describe how controlling the transport of SONET-structured data using a CTR differs from a conventional SONET transmission.

Transport of SONET data is inherently coordinated through a common system clock, i.e. GPS or Stratum-3, for maintaining "synchronous" communication. It is not clearly described how the application of CTR time frames would differ from the common system clock of a conventional SONET transmission.

- In reference to claims 2-23, 25-36, and 38-45

Claims 2-23, 25-36 and 38-45 are rejected due to dependence from the parent claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not possible to have at least two and at least three time frame queues. For purpose of examination, the examiner interprets the claim as "The switch as in claim 20, wherein there are at least two time frame queues"

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4, 22, 24-30, 32, 34, 37-38, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Davidson.

- In reference to claim 1, 2, 24, 25, 37, 38

Davidson teaches a method and system comprising:

- SONET inherently contains a primary reference clock such as a Stratum 3 that is derived from the cesium atomic standard, furthermore SONET is time framed based and inherently involves a plurality of time frames such as STS-1 frames that are inherently 125μs in length. (pg 98-99)

- A SONET terminal demultiplexer that can separate a STS-3 frame into 3 STS-1 frames (115-116)
- Each SONET frame consists of atleast one Synchronous Payload Envelope (SPE) that contain data such as frame and cell relay data (pg 95)
- A Terminal SONET Multiplexer inherently maps each SONET frame to a time frame for transmission (Figure 8.1)
- Multiplexed SONET frames are transported over an optical channel

- In reference to claim 4, 40

Davidson teaches that three STS-1 SONET frames of 125μs can be concatenated to a STS-3 SONET frame. (pg 98)

- In reference to claim 26, 27

Davidson teaches that a multiplexer can add several ATM cells to a SPE of a STS-1 frame. Three STS-1 frames can be multiplexed together to form a STS-3 frame. (pg 104-105)

- In reference to claims 28, 29, 30, 32

In Figure 8.1, Davidson teaches a SONET frame on a high-speed channel (OC-N where N=3,12,48) that is demultiplexed onto a plurality of low speed channels (OC-M) where the OC-N channel has a greater bit rate than the OC-M channels. (pg 116-117)

- In reference to claims 34

Davidson teaches that a SONET frame contains transport overhead, path overhead, and payload sections. (pg. 104)

- In reference to claim 22

Davidson teaches that an Add/Drop multiplexer maps data from multiple SONET sub channels to a SONET frame for transport via another channel (Figure 8.1)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 31, 33 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidson.

- In reference to claim 3 and 39

In Table 7.1, Davidson teaches that SONET frames can be STS-1, STS-3, STS-12, STS-48, and STS-192. (pg 99)

Davidson does not teach that SONET frames can be STS-768.

Official notice is taken that SONET frames can be STS-768 frames by multiplexing four STS-198 frames.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davidson to include the SONET frames being STS-768 by multiplexing four STS-198 frames together because it allows for a greater transmission rate of the data.

- In reference to claim 31 and 33

Davidson teaches a system and method that covers substantially all limitations of the parent claims. In Table 7.1, Davidson further teaches that the second bit rate can be STS-1, STS-3, STS-12, STS-48, and STS-192. (pg 99)

Davidson does not teach the second bit rate can be STS-768.

Official notice is taken that the second bit rate can be STS-768 frames by multiplexing four STS-198 frames.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davidson to include the SONET frames being STS-768 by multiplexing four STS-198 frames together because it allows for a greater transmission rate of the data.

Claims 5-18, 41-45 rejected under 35 U.S.C. 103(a) as being unpatentable over Davidson in view of Noser (US 5315594).

- In reference to claim 5, 6, 41, 42

Davidson teaches wideband type and broadband type digital cross-connects and switches in an SONET environment. (pg 121-124)

Davidson does not explicitly teach:

- A switching node with a plurality of input ports each having a unique address and a plurality of output ports each having a unique address;
- A position logic for determining a relative position for each of said respective incoming parts of the SONET frame within the respective particular time frame
- A forwarding and transmit delineation controller responsive to (1) the unique address of the input port associated with each one of the incoming parts of the SONET frames; (2) the associated time frame of arrival; and (3) the associated relative position for each said respective incoming parts of the SONET frame within said time frame of arrival, to provide a routing to an associated particular one of the output ports at an associated particular position and within an associated second particular time frame.

In Figure 1 Noser teaches a system comprising:

- A Cross-Connect with a plurality of input ports and a plurality of output ports, where each port inherently has a unique address, (column 5 lines 39-40) that are connect to a SONET interface (12 and 14) that receives incoming or outgoing STS-N frames as well as terminates selected overhead bytes from the SONET signals, communicates overhead with the SONET cross-connect control (24), passes overhead through the interface to the appropriate functional blocks within the SONET cross-connect, and rearranges overhead

bytes to/from the SONET cross-connect internal structure (column 5 lines 31-38)

- A SONET overhead processing/interfaces (22) for processing the overhead of the incoming SONET frames, and communicating overhead information with the SONET cross connect control (24) (column 5 lines 49-53)
- A SONET cross-connect control (24) controls the SONET cross-connect (10) relative to the overhead information received, communicates overhead information to other functional blocks, and interfaces all functional blocks. (column 5 lines 54-59) The controller can route the SONET frame to a plurality of output ports via the cross-connect (16).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method as taught by Davidson to include the cross-connect as taught by Noser because it allows for the data to be switched from one of a plurality of input ports to one of a plurality of output ports in a SONET network.

- In reference to claim 7, 8, 10, 11, 12

Davidson teaches a system that covers substantially all limitations of the parent claims. Davidson further teaches:

- Transmitting STS-1 frames cyclically where the frames are inherently 125 μs in length. The overhead bytes in a stream of STS-1 frames repeat every 125 μs, which is a predefined sequence of time units of equal duration.

- The SONET frame contains Section overhead, line overhead, STS POH, and VT POH.
- An STS-1 frame contains an A1 and A2 byte for framing and marks the start of the STS-1 frame. (pg 106)
- The C1 byte identifies each STS-1 within an STS-N

Davidson does not teach a position counter that counts the position delimiters in a frame.

Noser teaches a system and a method comprising of:

- A SONET overhead processing/interface (24) that inherently contains a position counter for keeping track of the bytes in the frame

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davidson to include a SONET cross connect with the SONET overhead processing/interface (24) as taught by Noser because it allows for the bytes within the frame to be processed accurately so the overhead and payload can be switched to the correct output port.

- In reference to claim 9

Davidson teaches a system that covers substantially all limitations of the parent claims. Davidson further teaches that SONET can transport formats of variable byte and time length including frame relay, SMDS, BISDN, and ATM. (pg 97)

- In reference to claim 13, 43

Davidson teaches in Figure 8.10 a Loop Feeder ring comprising:

- At least two SONET Add/Drop multiplexers connected via at least one optical channel where SONET Add/Drop multiplexers switch data to/from a plurality of channels
- A SONET Add/Drop multiplexer that inherently transfers one of the parts of the SONET frame into the network element, and a second predefined time frame within which the respective part of the SONET frame is forwarded out of the respective network element
- The time frame assignment of the channels provides consistent fixed intervals between the time between the input to and output from the pipe

Davidson does not explicitly teach a Forwarding and Transmit Delineation Controller for assigning selected predefined time frames for transfer into and out from each of the respective switching nodes responsive to the common time reference.

Noser teaches a SONET cross-connect control (24) controls the SONET cross-connect (10) relative to the overhead information received and communicates the overhead information to other functional blocks. (column 5 lines 54-59)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davidson to include a controller (24) as taught by Noser because it would allow the data to be Add/Drop into the network via a SONET frame as specified by the synchronistic nature of the network.

- In reference to claim 14, 15, 16, 44, 45

Davidson teaches a system and method that covers substantially all limitations of the parent claims. Davidson further teaches at least two Add/Drop Multiplexers interconnected via an optical channel in a path where each of the optical channels can be used by at least two of the pipes. (pg 128-129) Davidson further teaches each node in the ring simultaneously transmits, receives, and monitors the two opposing paths. (pg 129)

- In reference to claim 17, 18

Davidson teaches a system and method that covers substantially all limitations of the parent claims. In Figure 8.8 and 7.3, Davidson further teaches a system comprising:

- A first and second OC-12 ADM connected by 2 optical channels
- A predefined number of STS-1 frames (TF) are grouped into a STS-3 frame (TC)
- A predefined number of the STS-3 frames (TC) are grouped into a STS-12 frame (CS)
- A primary reference clock where each node in the ring simultaneously transmits, receives, and monitors the two opposing paths. (pg 129)
- SONET inherently has a timing reference that can be GPS based or internally generated. An internal reference at each switch would allow each incoming channel to have a unique time reference that is independent of each other.

Davidson does not teach:

- A communication switch containing a plurality of input and output ports

- A controller connected to the CTR, input ports, and the output ports

Noser teaches a SONET cross-connect comprising:

- An optical Cross-Connect (16) with a plurality of input and output ports
- A Control (24), inherently coupled to a primary reference clock, the input and the output ports (12, 14, 16)
- A Cross-connect (16), coupled to the control (24), the input and output ports (12, 14)
- A control (24) inherently responsive to the primary reference clock for scheduling connection to the cross-connect from a input port
- A control (24) that defines the coupling of the data from the input ports to the output ports

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davidson to include the SONET cross-connect as taught by Noser because it allows data to be switched to/from the SONET to/from an ATM, BISDN, frame relay, or SMDS network.

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidson in view of Noser, as applied to the parent claim, and further in view of Khacherian et al (US 5,768,257).

- In reference to claim 19, 20, 21

The combination of Davidson and Noser teach a system and method that covers substantially all limitations of the parent claims.

The combination of Davidson and Noser does not teach a plurality of buffer queues or a mapping controller.

In Figure 3, Khacherian et al. teaches a switch and method comprising of:

- Buffer queues (312, 322) that are associated with a combination of one of the incoming or going channels
- A input buffer controller (316) and a output data flow controller (326) for mapping the frames to a buffer queue
- Means to determine whether the queues are empty or not
- A input buffer controller (316) maps the data frames from a incoming channel to the queues
- A output data flow controller (326) to transfer the stored data to an outgoing channel during transmission of the frames
- An alignment subsystem (310) for transferring the incoming data from a channel into a queue
- An alignment subsystem (320) that transfers the data from a queue out a outgoing channel during a selected time frame
- Where the input queue (312) and output queue (322) are mutually exclusive

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of the combination of Davidson and Noser to include the system of buffer queues as taught by Khacherian et al. because it allows for the incoming and outgoing data to be buffered to prevent collisions and so that the data can be inserted within the correct time frame of the SONET.

Claim 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Davidson in view of Noser, as applied to the parent claim, and further in view of Shiragaki et al. (US 6115517).

- In reference to claim 23

The combination of Davidson and Noser teach a system and method that covers substantially all limitations of the parent claims.

The combination of Davidson and Noser do not teach a system where the switch network is an optical crossbar.

Shiragaki et al. teaches an optical communications network that contains an optical crossbar.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of the combination of Davidson and Noser to include an optical crossbar as taught by Shiragaki et al. because an optical crossbar allows for switching in the optical domain and increases the switching rate of the data.

- In reference to claims 35 and 36

Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidson in view of Parruck et al. (US 5142529).

Davidson teaches a system and method that covers substantially all limitations of the parent claims.

Davidson does not teach transporting only the POH and Payload portions of the SONET frame or transfer of only the Payload portion of the SONET frame.

Parruck et al. teaches a method for transporting the data payload or SPE (POH and data) of a SONET frame. (Abstract)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of the system and method as taught by Davidson to include the method of transferring only the payload portion as taught by Parruck et al. because it allows for a more efficient transmission method and increase the efficiency use of the bandwidth.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are:

- Noser (US 5,365,518) teaches a server combining a multiplexer/demultiplexer with a circuit switch to handle high-speed overhead.
- Brackett et al. (US 5,303,078) teaches an optical switch with a plurality of input and output ports.
- Upp et al. (US 4,967,405) teaches a system for cross-connecting high speed digital sonnet signals.
- Kosugi et al. (US 5,189,410) teaches a digital cross connect system in a synchronous optical network.

- Thomas et al. (US 4,881,163) teaches a system with a queue buffer and a controller.
- Servel et al. (US 4,980,885) teaches a system with a plurality of input buffer of the switcher and detects a load interruption when all queues signal a state of packet emptiness.
- Tyrrell et al. (US 5,185,736) teaches a synchronous optical transmission system for interfacing SONET formatted channels to lower speed channels in either a SONET format or otherwise.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Roberts whose telephone number is (571) 272-3095. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BSR

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